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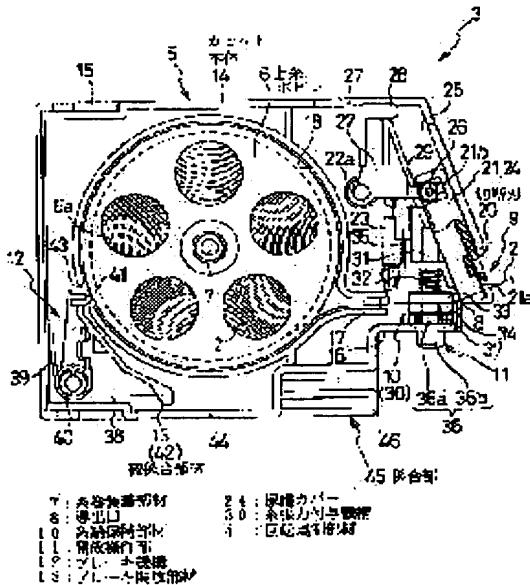
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(54) NEEDLE THREAD CASSETTE AND NEEDLE THREAD-EXCHANGING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a needle thread cassette and a thread-exchanging device for simplifying the structure of the thread-exchanging device and miniaturizing the device by simplifying the color-changing operation of a needle thread during sewing operation or thread-exchanging operation.

SOLUTION: The needle thread-exchanging device comprises a cassette body 5 including a cassette body 14 made of a synthetic resin, and a cassette lid 15 that can be opened or closed to the cassette body 14, a bobbin-winding fitting member 7 that is provided inside the cassette body 5 and fits a needle thread bobbin 6 where a needle thread 2 is wound, a cutting mechanism 9 for cutting the needle thread 2 that is withdrawn from the needle thread bobbin 6, and a thread end-retaining member 10 for retaining the thread end section of the needle thread 2 that is cut by the cutting mechanism 9, thus dispensing with withdrawing the thread end section every time the cassette is fitted for setting, and simplifying the thread-exchanging operation of the needle thread 2 during sewing operation.



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CLAIMS

[Claim(s)]

[Claim 1] The cassette object which is the needle-thread cassette which can hold the needle thread with which sewing is presented, and contains the cassette lid which can be opened and closed to the body of a cassette and this body of a cassette made of synthetic resin, The bobbin carrying member which can equip with the bobbin member around which it was prepared in the interior of said cassette object, and the needle thread was twisted, The needle-thread cassette characterized by having the cutting machine style which cuts the needle thread pulled out from the bobbin member with which said bobbin carrying member was equipped, and a margin-of-string attachment component holding the margin-of-string section of the needle thread cut by said cutting machine style.

[Claim 2] Said cutting machine style is a needle-thread cassette according to claim 1 characterized by being constituted so that the margin-of-string section of the needle thread after cutting may project from the predetermined die-length aforementioned margin-of-string attachment component and a needle thread may be cut.

[Claim 3] Said cassette object is a needle-thread cassette according to claim 1 or 2 characterized by having had derivation opening for deriving the margin-of-string section of the needle thread pulled out from said bobbin member with which said bobbin carrying member was equipped to the exterior of a cassette object, and preparing said margin-of-string attachment component and said cutting machine style near this derivation opening.

[Claim 4] A needle-thread cassette given in any of claims 1-3 characterized by having a yarn tension grant means to give tension to the needle thread pulled out from said bobbin member with which said bobbin carrying member was equipped they are.

[Claim 5] The needle-thread cassette according to claim 4 characterized by having the opening operation section opened so that said yarn tension grant means may be operated from the outside and tension may not be given.

[Claim 6] The needle-thread cassette according to claim 4 or 5 characterized by said margin-of-string attachment component serving as said yarn tension grant means.

[Claim 7] It is a needle-thread cassette given in any of claims 1-6 characterized by said bobbin carrying member equipping with the needle-thread bobbin pivotable said bobbin member with which said bobbin carrying member is equipped is a needle-thread bobbin with small shaft-orientations width of face as compared with the diameter, and they are.

[Claim 8] The needle-thread cassette according to claim 7 characterized by having the brake mechanism which makes damping force act on said needle-thread bobbin with which said bobbin carrying member is equipped.

[Claim 9] The needle-thread cassette according to claim 8 characterized by having the brake disconnection member which makes the damping force by said brake mechanism open wide by being operated from the exterior of said cassette object.

[Claim 10] Said bobbin member with which said bobbin carrying member is equipped is a needle-thread cassette given in any of claims 1-6 characterized by being a yarn die they are.

[Claim 11] The accommodated location which the axial supporter material to which the pivotable support shaft which supports said yarn die pivotably, and this pivotable support shaft are fixed in the shape of a support at one end is prepared in the interior of said cassette object, and holds said yarn die for said axial supporter material and pivotable support shaft in the interior of a cassette object, The needle-thread cassette according to claim 10 characterized by establishing the linkage which opens said cassette lid wide and connects a yarn die with a cassette object rotatable covering the exchange location to which the pivotable

support shaft was leaned from said accommodated location exchangeable.

[Claim 12] The needle-thread cassette according to claim 11 characterized by forming two or more guide rails which prepare possible [wearing of the yarn-die presser foot which presses down the yarn die supported pivotably by said pivotable support shaft], and show a needle thread to the periphery edge of this yarn-die presser foot.

[Claim 13] Said yarn-die presser foot is a needle-thread cassette according to claim 12 characterized by having consisted of the fixed part fixed to said pivotable support shaft, and the rotation section supported rotatable to the fixed part, and preparing said two or more guide rails in the periphery of this rotation section.

[Claim 14] Said cassette object is a needle-thread cassette given in any of claims 1-13 characterized by consisting of transparent materials to which the part or all can check by looking the needle thread twisted around the bobbin member inside a cassette they are.

[Claim 15] Said cassette object and said needle-thread bobbin are a needle-thread cassette given in any of claims 7-9 characterized by consisting of transparent materials to which the part or all can check by looking the needle thread twisted around the needle-thread bobbin inside a cassette they are.

[Claim 16] Said needle-thread cassette is a needle-thread cassette given in any of claims 1-15 characterized by being the needle-thread cassette with which the needle-thread swap device for supplying alternatively the needle thread of two or more colors for embroidery sewing is equipped they are.

[Claim 17] Said needle-thread cassette is a needle-thread cassette given in any of claims 1-16 characterized by being the needle-thread cassette with which the proper place of the arm section of a sewing machine is equipped they are.

[Claim 18] In the needle-thread swap device for supplying alternatively the needle thread of two or more colors for embroidery sewing to sewing equipment Two or more needle-thread cassettes which held the needle thread of two or more colors, respectively, and the needle-thread cassette of these plurality The cassette mount with which it can equip free [attachment and detachment], The needle-thread swap device characterized by having the change-over device which switches the location of a cassette mount so that one of the arbitration of two or more needle-thread cassettes with which said cassette mount was equipped may be located in the needle-thread supply location to said sewing equipment.

[Claim 19] The cassette object with which said needle-thread cassette contains the cassette lid which can be opened and closed to the body of a cassette and this body of a cassette made of synthetic resin, The bobbin carrying member which can equip with the bobbin member around which it was prepared in the interior of said cassette object, and the needle thread was twisted, The needle-thread swap device according to claim 18 characterized by having the cutting machine style which cuts the needle thread pulled out from the bobbin member with which said bobbin carrying member was equipped, and a margin-of-string attachment component holding the margin-of-string section of the needle thread cut by said cutting machine style.

[Claim 20] In the needle-thread cassette constituted removable by the needle-thread swap device for supplying alternatively the needle thread of sewing equipment or two or more colors for sewing to sewing equipment The body of a cassette, and the cassette object which contains the cassette lid which can be opened and closed to this body of a cassette, The needle-thread cassette characterized by having the bobbin carrying member which equips with the bobbin member around which it was prepared in the interior of said body of a cassette, and the needle thread was twisted pivotable, and the rotation specification-part material which regulates rotation of said bobbin member.

[Claim 21] The needle-thread cassette according to claim 20 characterized by to have the engaged portion material which engages with the engagement section prepared in said sewing equipment or said needle-thread swap device, to open regulation by said rotation specification-part material wide in the state of wearing of the cassette object to said sewing equipment or said needle-thread swap device when said engaged portion material engages with said engagement section, and for regulation by said rotation specification-part material to act on said bobbin member in the condition do not equip.

[Claim 22] The needle-thread cassette according to claim 20 or 21 characterized by preparing the engagement section which shows the wearing actuation to said sewing equipment or said needle-thread swap device to said cassette object.

[Claim 23] In the needle-thread cassette constituted removable by the needle-thread swap device for supplying alternatively the needle thread of sewing equipment or two or more colors for sewing to sewing equipment The body of a cassette, and the cassette object which contains the cassette lid which can be opened and closed to this body of a cassette, The bobbin carrying member equipped with the bobbin member around which it was prepared in the interior of said body of a cassette, and the needle thread was

twisted, Derivation opening for deriving the margin-of-string section of the needle thread pulled out from said bobbin member with which was prepared in said cassette object and said bobbin carrying member was equipped to the exterior of a cassette object, The cutting machine style which is a cutting machine style which cuts the needle thread pulled out from said bobbin member, and cuts a needle thread so that the margin-of-string section of the needle thread after cutting may carry out a predetermined die-length protrusion from said derivation opening, The needle-thread cassette characterized by having a margin-of-string attachment component holding the margin-of-string section of the needle thread cut by said cutting machine style.

[Claim 24] The needle-thread cassette according to claim 23 characterized by having a movable protective cover covering the stowed position in the condition that said sewing equipment or said needle-thread swap device was equipped with said cassette object, and the non-stowed position at the time of un-equipping, and for said protective cover covering the margin-of-string section of said projecting needle thread in said non-stowed position, and evacuating from the margin-of-string section in said stowed position.

[Claim 25] Said cutting machine style is a needle-thread cassette according to claim 24 characterized by consisting of the attachment component holding a cutting cutting edge and its cutting cutting edge, and this attachment component constituting said protective cover.

[Claim 26] In the needle-thread cassette constituted removable by the needle-thread swap device for supplying alternatively the needle thread of sewing equipment or two or more colors for sewing to sewing equipment The body of a cassette, and the cassette object which contains the cassette lid which can be opened and closed to this body of a cassette, The bobbin carrying member equipped with the bobbin member around which it was prepared in the interior of said body of a cassette, and the needle thread was twisted, The needle-thread cassette characterized by having derivation opening for deriving the needle thread pulled out from said bobbin member to the exterior of said cassette object that said sewing equipment or said needle-thread swap device should be supplied, and a yarn tension grant means to give tension to the needle thread pulled out from said bobbin member.

[Claim 27] Said yarn tension grant means is a needle-thread cassette according to claim 26 characterized by being the yarn pinching member which pinches the needle thread which is prepared near said derivation opening and pulled out from the derivation opening.

[Claim 28] The needle-thread cassette according to claim 27 characterized by said yarn pinching member serving as the margin-of-string attachment component holding the margin-of-string section of the needle thread pulled out from said derivation opening.

[Claim 29] The needle-thread cassette according to claim 26 or 27 characterized by having the opening operation section opened so that said yarn tension grant means may be operated from the outside and tension may not be given.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] Especially this invention relates to the needle-thread cassette and needle-thread swap device which simplified the yarn exchange activities at the time of the color substitute activity of the needle thread under sewing activity etc. about a needle-thread cassette and a needle-thread swap device.

[0002]

[Description of the Prior Art] To do the sewing activity by the sewing machine conventionally, it is necessary to equip a sewing machine with the yarn die around which the desired colored yarn was wound as a dead work before sewing initiation, to pull out a needle thread from this yarn die, and to do a thread-guard activity to predetermined devices, such as a tension thread guard, a thread tension unit, and a balance, and it necessary to let a needle thread pass to a pinholing. When having sometimes performed embroidery sewing among sewing activities and the embroidery pattern which performs sewing seems to have consisted of two or more colored yarns, sewing by the desired colored yarn was completed and the operator needed to repeat complicated activity of performing the thread guard and threader actuation to each device and pinholing of the yarn die of a colored yarn which perform the following sewing continuously and which were equipped with and mentioned above, whenever it changes a thread color.

[0003] It equips with two or more yarn dies, one of yarn dies [them] is chosen in recent years, and practical use is presented with the equipment linked to the margin of string by the side of a sewing machine (refer to JP,3-36557,B and JP,9-302571,A). With the equipment of said JP,3-36557,B, the margin of string by the side of the cut sewing machine and the margin of string of a desired colored yarn are held in the orientation of a yarn connecting means after cutting a needle thread, and it connects with heating through connection yarn.

[0004] With the equipment of JP,9-302571,A, the vacuum from a tube is started, and it moves so that a yarn clamp and a wiper may be drawn to a needle. After the margin of string of a needle thread is clamped with the wall and vacuum ball of a yarn clamp, a hook and a yarn clamp move to an index side in a cylinder. A vacuum is stopped and a yarn clamp and a wiper are evacuated to the original location in a cylinder.

[0005] The clamped margin of string moves to a gear side, and a needle thread is pulled out. Then, the hook supplementary to yarn retreats, between one pair of gears is closed down in a cylinder, energization of the heating wire of thread-cutter equipment is started, and a needle thread is cut. Then, after it moves a knotter to a yarn epilogue location in a cylinder and a cylinder closes a stitch-balancing-thread-tension pan, a yarn epilogue activity is done in a cylinder.

[0006] Moreover, in what uses said conventional yarn die, in case a needle thread is pulled out from a yarn die, a needle thread is pulled out by the reaction force (force from which it is going to separate from a yarn die) of the yarn wound around the yarn die from a yarn die beyond the need, and slack arises in a needle thread on the path from a yarn die to a tension thread guard in many cases. when the slack of yarn besides arises, from this yarn, (slack yarn should twine or a lap should be made) arises in the needle thread on said path from yarn, it originates [it is alike,] in it, and the tension of a needle thread is changed, harmony with a bobbin thread collapses and it sews, and the appearance of a riser may worsen, or when severe, the thread breakage may arise, or a needle may break

[0007] Then, fixed tension is given to the needle thread pulled out, and the needle-thread cassette which held the needle thread that ***** of yarn should be prevented is proposed and put in practical use (patent No. 2650261). The needle-thread cassette of this official report consists of the body of a cassette, a yarn hold hole, the needle thread that was held in this yarn hold hole and wound around the needle-thread bobbin, a L character-like flat spring, a pin, two or more notches, etc. It is pinched between a flat spring and a pin,

tension is given, and a needle thread is pulled out from a drawer hole. And said tension is adjusted by changing the engagement location of the projection and notch of a flat spring.

[0008]

[Problem(s) to be Solved by the Invention] Equipment itself is enlarged, in structure's becoming complicated and becoming expensive with the conventional equipment of a publication at said JP,3-36557,B and JP,9-302571,A. By the conventional needle-thread cassette of a said patent [No. 2650261] publication, after demounting the needle-thread cassette from a sewing machine after a thread cutter and equipping with the needle-thread cassette of another color at the time of the color substitute activity of the needle thread under sewing activity, it must be in a pinholing in through direct one through a tension thread guard, stitch balancing thread tension, and a balance, but is forced a complicated activity.

[0009] Moreover, since it is necessary to hold where the needle thread after cutting is projected by suitable die length from a cassette in preparation for a reuse (re-wearing of a needle-thread cassette), the thrust which acts between a flat spring and a pin is set up strongly, and the needle thread in a cassette needs to be made not to be pulled out at the time of un-equipping with a needle-thread cassette too much. On the other hand, in order to pull out a needle thread required for the sewing activity by the sewing machine from a cassette in the time of wearing of a needle-thread cassette, it must set up so that the thrust between said flat springs and pins may become weak. The purposes of this invention are simplifying the yarn exchange activities at the time of a color substitute of the needle thread under sewing activity etc., simplifying the structure of a yarn swap device and attaining a miniaturization, etc.

[0010]

[Means for Solving the Problem] The cassette object which the needle-thread cassette of claim 1 is a needle-thread cassette which can hold the needle thread with which sewing is presented, and contains the cassette lid which can be opened and closed to the body of a cassette and this body of a cassette made of synthetic resin, The bobbin carrying member which can equip with the bobbin member around which it was prepared in the interior of said cassette object, and the needle thread was twisted, It is characterized by having the cutting machine style which cuts the needle thread pulled out from the bobbin member with which said bobbin carrying member was equipped, and a margin-of-string attachment component holding the margin-of-string section of the needle thread cut by said cutting machine style.

[0011] According to the needle-thread cassette according to claim 1, the bobbin carrying member inside a cassette object is equipped with the spool member which twisted the needle thread, and the margin-of-string section of a needle thread is pulled out from the needle-thread cassette. Next, a cassette lid is closed and the needle thread pulled out from the spool member with which the bobbin carrying member was equipped is cut at cutting machine guard. The margin-of-string section of the cut needle thread is held by the margin-of-string attachment component. Then, a sewing activity is done after equipping a predetermined location with a needle-thread cassette. Since the margin-of-string section of a needle thread is held by the margin-of-string attachment component, need to pull out the margin-of-string section, it is not necessary to set it for every cassette wearing, and the color substitute activity of a needle thread or yarn exchange activity under sewing activity simplifies.

[0012] Said cutting machine style is characterized by being constituted so that the margin-of-string section of the needle thread after cutting may project from the predetermined die-length aforementioned margin-of-string attachment component and the needle-thread cassette of claim 2 may cut a needle thread in invention of claim 1. Since according to this needle-thread cassette according to claim 2 the margin-of-string section of said needle thread is held by the margin-of-string attachment component where a predetermined die-length protrusion is carried out, while being able to attain automation of the color substitute activity of a needle thread, or a yarn exchange activity using the device by the side of equipment, it can prevent that a needle thread solves suddenly from a margin-of-string attachment component, twine, or the margin-of-string section is drawn in a needle-thread cassette.

[0013] The needle-thread cassette of claim 3 is equipped with derivation opening for said cassette object to derive the margin-of-string section of the needle thread pulled out from said bobbin member with which said bobbin carrying member was equipped to the exterior of a cassette object in invention of claims 1 or 2, and it is characterized by preparing said margin-of-string attachment component and said cutting machine style near this derivation opening. According to this needle-thread cassette according to claim 3, since the margin-of-string attachment component and the cutting machine style were prepared near the derivation opening, where the margin-of-string section of a needle thread is made to project to the exterior of a cassette object, a needle thread can be cut, preventing yarn slack and a **** ball.

[0014] The needle-thread cassette of claim 4 is characterized by having a yarn tension grant means to give

tension to the needle thread pulled out from said bobbin member with which said bobbin carrying member was equipped in invention [which / of claims 1-3]. According to this needle-thread cassette according to claim 4, tension can be given to the needle thread pulled out from a bobbin member by the yarn tension grant means.

[0015] The needle-thread cassette of claim 5 is characterized by having the opening operation section opened so that said yarn tension grant means may be operated from the outside and tension may not be given in invention of claim 4. According to this needle-thread cassette according to claim 5, it can open wide so that the opening operation section may not give tension to a needle thread, and it can let out a needle thread to the exterior of this needle-thread cassette easily.

[0016] The needle-thread cassette of claim 6 is characterized by said margin-of-string attachment component serving as said yarn tension grant means in invention of claims 4 or 5. That is, the margin-of-string section of a needle thread can be held by giving tension to the needle thread pulled out from a bobbin member.

[0017] It is characterized by for said bobbin member by which said bobbin carrying member is equipped with the needle-thread cassette of claim 7 in invention [which / of claims 1-6] being a needle-thread bobbin with small shaft-orientations width of face as compared with the diameter, and said bobbin carrying member equipping with the needle-thread bobbin pivotable. So, the width method of a needle-thread cassette can be made small, and the miniaturization of the needle-thread cassette itself can be attained.

[0018] The needle-thread cassette of claim 8 is characterized by having the brake mechanism which makes damping force act on said needle-thread bobbin with which said bobbin carrying member is equipped in invention of claim 7. According to this needle-thread cassette according to claim 8, damping force can be made to be able to act on a needle-thread bobbin according to a brake mechanism, and a skid of a needle-thread bobbin can be prevented.

[0019] It is characterized by equipping the needle-thread cassette of claim 9 with the brake disconnection member which makes the damping force by said brake mechanism open wide by being operated from the exterior of said cassette object in invention of claim 8, and a brake disconnection member is operated from the exterior of a cassette object, and the damping force by the brake mechanism is opened.

[0020] Said bobbin member by which said bobbin carrying member is equipped with the needle-thread cassette of claim 10 in invention [which / of claims 1-6] is characterized by being a yarn die. According to this needle-thread cassette according to claim 10, the existing yarn die can be applied and a bobbin carrying member is equipped with the yarn die with which the needle thread was twisted.

[0021] The axial supporter material to which the pivotable support shaft with which the needle-thread cassette of claim 11 supports said yarn die pivotably inside said cassette object in invention of claim 10, and this pivotable support shaft are fixed in the shape of a support at one end is prepared. The accommodated location which holds said yarn die for said axial supporter material and pivotable support shaft in the interior of a cassette object, and said cassette lid are opened wide, and it is characterized by establishing the linkage which connects a yarn die with a cassette object rotatable covering the exchange location to which the pivotable support shaft was leaned from said accommodated location exchangeable.

[0022] According to this needle-thread cassette according to claim 11, a cassette lid is opened and an exchange location is made to rotate a pivotable support shaft and axial supporter material according to a linkage. A yarn die is supported pivotably on a pivotable support shaft in this exchange location, next an accommodated location is made to rotate a pivotable support shaft and axial supporter material according to a linkage with a yarn die, a cassette lid is closed, and sewing is presented after that.

[0023] In invention of claim 11, the needle-thread cassette of claim 12 is prepared possible [wearing of the yarn-die presser foot which presses down the yarn die supported pivotably by said pivotable support shaft], and is characterized by forming two or more guide rails which show a needle thread to the periphery edge of this yarn-die presser foot. Since according to this needle-thread cassette according to claim 12 the needle thread which equipped the pivotable support shaft with the yarn-die presser foot, pressed down the yarn die, and was pulled out by the guide rail of this yarn-die presser foot from the yarn die is guided after supporting a yarn die pivotably on a pivotable support shaft in an exchange location, the slack of yarn and generating [yarn] can be prevented.

[0024] In invention of claim 12, said yarn-die presser foot consists of the fixed part fixed to said pivotable support shaft, and the rotation section supported rotatable to the fixed part, and the needle-thread cassette of claim 13 is characterized by preparing said two or more guide rails in the periphery of this rotation section. Since according to this needle-thread cassette according to claim 13 the rotation section rotates in connection with a needle thread being pulled out from a yarn die where a needle thread is guided one of two

or more guide rails, yarn slack and generating [yarn] can be prevented more certainly.

[0025] In invention [which / of claims 1-13], said cassette object can be characterized by consisting of transparent materials to which the part or all can check by looking the needle thread twisted around the bobbin member inside a cassette, and the needle-thread cassette of claim 14 can check the colored yarn and yarn residue of a needle thread from the outside.

[0026] In invention [which / of claims 7-9], the needle-thread cassette of claim 15 can be characterized by said cassette object and said needle-thread bobbin consisting of transparent materials to which the part or all can check by looking the needle thread twisted around the needle-thread bobbin inside a cassette, and can check from the outside the colored yarn and yarn residue of a needle thread which were twisted around the needle-thread bobbin.

[0027] The needle-thread cassette of claim 16 is characterized by said needle-thread cassette being a needle-thread cassette with which the needle-thread swap device for supplying alternatively the needle thread of two or more colors for embroidery sewing is equipped in invention [which / of claims 1-15]. According to this needle-thread cassette according to claim 16, a needle-thread swap device is equipped with the needle-thread cassette of two or more classification by color, and it embroiders by supplying the needle thread of a desired colored yarn alternatively from one of any needle-thread cassettes of these.

[0028] In invention [which / of claims 1-16], the needle-thread cassette of claim 17 is characterized by said needle-thread cassette being a needle-thread cassette with which the proper place of the arm section of a sewing machine is equipped, equips the proper place of the arm section of a sewing machine with the needle-thread cassette of a desired colored yarn, and does a sewing activity.

[0029] In a needle-thread swap device for the needle-thread swap device of claim 18 to supply alternatively the needle thread of two or more colors for embroidery sewing to sewing equipment Two or more needle-thread cassettes which held the needle thread of two or more colors, respectively, and the needle-thread cassette of these plurality The cassette mount with which it can equip free [attachment and detachment], It is characterized by having the change-over device which switches the location of a cassette mount so that one of the arbitration of two or more needle-thread cassettes with which said cassette mount was equipped may be located in the needle-thread supply location to said sewing equipment.

[0030] According to invention given in this claim 18, a cassette mount is equipped with two or more needle-thread cassettes, and according to a change-over device, the location of a cassette mount is switched so that one of the arbitration of two or more needle-thread cassettes may be located in the needle-thread supply location to sewing equipment. And the needle thread of the colored yarn of said needle-thread cassette is supplied to sewing equipment.

[0031] The cassette object with which, as for the needle-thread swap device of claim 19, said needle-thread cassette contains the cassette lid which can be opened and closed in invention of claim 18 to the body of a cassette and this body of a cassette made of synthetic resin, The bobbin carrying member which can equip with the bobbin member around which it was prepared in the interior of said cassette object, and the needle thread was twisted, It is characterized by having the cutting machine style which cuts the needle thread pulled out from the bobbin member with which said bobbin carrying member was equipped, and a margin-of-string attachment component holding the margin-of-string section of the needle thread cut by said cutting machine style.

[0032] According to invention given in this claim 19, the bobbin carrying member inside a cassette object is equipped with the spool member which twisted the needle thread, and the margin-of-string section of a needle thread is pulled out from the needle-thread cassette. Next, a cassette lid is closed and the needle thread pulled out from a spool member at cutting machine guard is cut. The margin-of-string section of the cut needle thread is held by the margin-of-string attachment component. Then, a sewing activity is done after equipping a needle-thread swap device with this needle-thread cassette.

[0033] In the needle-thread cassette constituted by the needle-thread swap device for the needle-thread cassette of claim 20 to supply alternatively the needle thread of sewing equipment or two or more colors for sewing to sewing equipment removable The body of a cassette, and the cassette object which contains the cassette lid which can be opened and closed to this body of a cassette, It is prepared in the interior of said body of a cassette, and is characterized by having the bobbin carrying member which equips with the bobbin member around which the needle thread was twisted pivotable, and the rotation specification-part material which regulates rotation of said bobbin member. By rotation specification-part material, rotation of the bobbin member with which the bobbin carrying member was equipped pivotable is regulated, and a skid of a bobbin member is prevented.

[0034] The needle-thread cassette of claim 21 is equipped with the engaged portion material which engages

with the engagement section prepared in said sewing equipment or said needle-thread swap device in invention of claim 20. In the state of wearing of the cassette object to said sewing equipment or said needle-thread swap device, when said engaged portion material engages with said engagement section, regulation by said rotation specification-part material is opened wide, and in the condition of not equipping, regulation by said rotation specification-part material is characterized by acting on said bobbin member. According to invention given in this claim 21, in the state of un-equipping with a cassette object, rotation of a bobbin member is regulated by rotation specification-part material. In the state of wearing of a cassette object, the engaged portion material by the side of a needle-thread cassette engages with the engagement section by the side of equipment, and opens regulation by rotation specification-part material.

[0035] The needle-thread cassette of claim 22 is characterized by preparing the engagement section which shows said cassette object to the wearing actuation to said sewing equipment or said needle-thread swap device in claim 20 or invention of 21. According to invention given in this claim 22, since the wearing actuation to sewing equipment or a needle-thread swap device is guided by the engagement section of a cassette object, wearing actuation simplifies by it.

[0036] In the needle-thread cassette constituted by the needle-thread swap device for the needle-thread cassette of claim 23 to supply alternatively the needle thread of sewing equipment or two or more colors for sewing to sewing equipment removable The body of a cassette, and the cassette object which contains the cassette lid which can be opened and closed to this body of a cassette, The bobbin carrying member equipped with the bobbin member around which it was prepared in the interior of said body of a cassette, and the needle thread was twisted, Derivation opening for deriving the margin-of-string section of the needle thread pulled out from said bobbin member with which was prepared in said cassette object and said bobbin carrying member was equipped to the exterior of a cassette object, The cutting machine style which is a cutting machine style which cuts the needle thread pulled out from said bobbin member, and cuts a needle thread so that the margin-of-string section of the needle thread after cutting may carry out a predetermined die-length protrusion from said derivation opening, It is characterized by having a margin-of-string attachment component holding the margin-of-string section of the needle thread cut by said cutting machine style.

[0037] In this invention according to claim 23, in the condition of a needle-thread cassette of not equipping, the margin-of-string section of a needle thread is pulled out from the bobbin member with which the bobbin carrying member was equipped, and a needle thread is cut as a cutting machine style is also, so that a predetermined die-length protrusion may be carried out from derivation opening. The margin-of-string section of this cut needle thread is held by the margin-of-string attachment component. Then, a needle-thread swap device is equipped with this needle-thread cassette.

[0038] In invention of claim 23, it has a movable protective cover covering the stowed position in the condition that said sewing equipment or said needle-thread swap device was equipped with said cassette object, and the non-stowed position at the time of un-equipping, said protective cover covers the margin-of-string section of said projecting needle thread in said non-stowed position, and the needle-thread cassette of claim 24 is characterized by evacuating from the margin-of-string section in said stowed position.

[0039] In this invention according to claim 24, the margin-of-string section of the needle thread which carries out a predetermined die-length protrusion from derivation opening is covered with a protective cover, and it prevents that that projecting margin-of-string section is exposed in the non-stowed position of a cassette object. A protective cover evacuates from the margin-of-string section, and the margin-of-string section is exposed in the stowed position to the equipment of a cassette object so that it may not become the hindrance of the needle-thread exchange actuation by the needle-thread swap device.

[0040] The needle-thread cassette of claim 25 consists of the attachment component to which said cutting machine style holds a cutting cutting edge and its cutting cutting edge in invention of claim 24, and it is characterized by this attachment component constituting said protective cover. Therefore, it is a wrap about the margin-of-string section of the needle thread which cuts a needle thread with a cutting cutting edge, and projects that the attachment component of a cutting machine style is also in the non-stowed position of a cassette object.

[0041] In the needle-thread cassette constituted by the needle-thread swap device for the needle-thread cassette of claim 26 to supply alternatively the needle thread of sewing equipment or two or more colors for sewing to sewing equipment removable The body of a cassette, and the cassette object which contains the cassette lid which can be opened and closed to this body of a cassette, The bobbin carrying member equipped with the bobbin member around which it was prepared in the interior of said body of a cassette, and the needle thread was twisted, It is characterized by having derivation opening for deriving the needle

thread pulled out from said bobbin member to the exterior of said cassette object that said sewing equipment or said needle-thread swap device should be supplied, and a yarn tension grant means to give tension to the needle thread pulled out from said bobbin member.

[0042] In this invention according to claim 26, with a yarn tension grant means, since tension can be given to the needle thread pulled out by the exterior of a cassette object, the needle thread beyond the need is pulled out by neither sewing equipment nor the needle-thread swap device, and the slack of yarn and generating [yarn] can be prevented.

[0043] The needle-thread cassette of claim 27 is characterized by said yarn tension grant means being a yarn pinching member which pinches the needle thread which is prepared near said derivation opening and pulled out from the derivation opening in invention of claim 26. So, a needle thread can be pinched by the yarn pinching member [near the derivation opening], and tension can be given to the needle thread pulled out outside.

[0044] The needle-thread cassette of claim 28 is characterized by said yarn pinching member serving as the margin-of-string attachment component holding the margin-of-string section of the needle thread pulled out from said derivation opening in invention of claim 27. That is, the margin-of-string section of the needle thread pulled out from derivation opening can be certainly held by pinching a needle thread by the yarn pinching member.

[0045] The needle-thread cassette of claim 29 is characterized by having the opening operation section opened so that said yarn tension grant means may be operated from the outside and tension may not be given in claim 26 or invention of 27. According to this needle-thread cassette according to claim 29, it can open wide so that the opening operation section may not give tension to a needle thread, and it can let out a needle thread to the exterior of this needle-thread cassette easily.

[0046]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. This operation gestalt is a thing at the time of applying this invention to the needle-thread swap device for supplying alternatively the needle thread of two or more needle-thread cassettes which held the needle thread of two or more colors for embroidery sewing, respectively to sewing equipment.

[0047] The needle-thread swap device 1 has the change-over device 50 which switches the location of a cassette mount 4 so that one of the arbitration of two or more needle-thread cassettes 3 equipped with two or more needle-thread cassettes 3 which can be held, respectively, and the needle-thread cassette 3 of these plurality for the needle thread 2 of two or more colors with which sewing is presented by the cassette mount 4 with which it can equip free [attachment and detachment], and the cassette mount 4 may be located in the needle-thread supply location to sewing equipment, as shown in drawing 1 -4.

[0048] In addition, although explanation is omitted about the concrete needle-thread exchange style in the needle-thread swap device 1 since it is not the theme of this invention The margin of string of a needle thread 2 cut by the needle-thread cutting machine style (not shown) which cuts the needle thread 2 pulled out from the needle-thread cassette 3 located in the needle-thread supply location to sewing equipment within this needle-thread swap device, and this needle-thread cutting machine style, It has further the margin-of-string attachment (not shown) which connects the margin of string of the needle thread 2 pulled out in this needle-thread swap device from other needle-thread cassettes 3 newly located in a needle-thread supply location. According to these devices By connecting the needle thread 2 held in a different needle-thread cassette 3, the needle thread 2 currently supplied to sewing equipment till then can be exchanged for a different needle thread 2 held in the different needle-thread cassette 3 concerned, and sewing equipment can be supplied now.

[0049] First, the needle-thread cassette 3 is explained. As shown in drawing 4 - drawing 8 , the needle-thread cassette 3 has the cassette object 5, the needle-thread bobbin 6 as a bobbin member, the bobbin carrying member 7, the derivation opening 8, the cutting machine style 9, the margin-of-string attachment component 10, the opening operation section 11, a brake mechanism 12, and the brake disconnection member 13. The cassette object 5 has the cassette lid 15 which can be opened and closed to the body 14 of a cassette, and this body 14 of a cassette. Those all consist of transparent materials made of synthetic resin, and the body 14 of these cassettes and the cassette lid 15 can check by looking the needle thread 2 twisted around the needle-thread bobbin 6 inside a cassette.

[0050] The step 16 is formed in the bottom corner of a wearing side to a cassette mount 4 although the body 14 of a cassette is formed in the shape of a side view abbreviation rectangle. The bobbin hold hole 18 which contains the needle-thread feed zone 17 in this body 14 of a cassette is formed, and the needle-thread bobbin

6 is held in this bobbin hold hole 18. The needle-thread bobbin 6 consists of transparent materials made of synthetic resin, and can check by looking from the exterior the needle thread 2 twisted around the needle-thread bobbin 6 inside a cassette.

[0051] Besides, the yarn bobbin 6 has small shaft-orientations width of face a little rather than the bobbin hold hole 18 as compared with the diameter and diameter of a minor diameter, and the bobbin carrying member 7 really formed in the core of the bobbin hold hole 18 of the body 14 of a cassette is equipped with it pivotable. Therefore, the cassette object 5 can be formed comparatively thinly and miniaturization and lightweight-ization can be attained. In addition, the plurality for lightweight-izing extracts and hole 6a is also formed. The cassette lid 15 is supported pivotably by the end section of the body 14 of a cassette possible [closing motion], and is constituted possible [engagement] through the engagement member 19 by the engaged portion besides the illustration by the side of the body 14 of a cassette.

[0052] Next, the cutting machine style 9 is explained. As shown in drawing 4, the cutting machine style 9 is a device in which the needle thread 2 pulled out from the needle-thread bobbin 6 with which the bobbin carrying member 7 was equipped is cut, and it is constituted so that the margin-of-string section of the needle thread 2 after cutting may project from the predetermined die-length margin-of-string attachment component 10 and a needle thread 2 may be cut. This cutting machine style 9 consists of extension-spring 23 grade which energizes the cutting cutting edge 20, the attachment component 21 holding that cutting cutting edge 20, the link member 22 for moving this attachment component 21, and an attachment component 21 to the lower part sense.

[0053] An attachment component 21 is formed in the shape of a rectangular parallelepiped, and constitutes a protective cover 24, and this protective cover 24 is movable covering the stowed position in the condition that the needle-thread swap device 1 was equipped with the cassette object 5, and the non-stowed position at the time of un-equipping [which is shown in drawing 4]. That is, the covering sliding hole 25 for a protective cover 24 is formed in the right end part of the body 14 of a cassette in drawing 4. a protective cover 24 -- the covering sliding hole 25 -- the upper and lower sides -- it is equipped movable, the margin-of-string section of the projecting needle thread 2 is covered in said non-stowed position, and it evacuates from the margin-of-string section in said stowed position.

[0054] The cutting cutting edge 20 is held at the bottom half section of an attachment component 21, and the lower limit section (cutting part) of the cutting cutting edge 20 exposes the cutting cutting edge 20 partially through slit 21a at the time of a non-stowed position. The derivation opening 8 for deriving the margin-of-string section of the needle thread 2 pulled out from the needle-thread bobbin 6 with which the bobbin carrying member 7 was equipped to the exterior of the cassette object 5 is formed in the body 14 of a cassette, and the cutting machine style 9 is formed in it near this derivation opening 8. The margin-of-string section of the needle thread 2 pulled out from the needle-thread bobbin 6 is derived from the derivation opening 8 to the exterior of the cassette object 5 through slit 21a. And to the cutting cutting edge 20, it is made to move manually and a part for the free edge of a needle thread 2 is cut.

[0055] The link member 22 is supported rockable considering pivotable support section 22a as a core near [covering sliding hole 25] the body 14 of a cassette. The crowning of the link member 22 is supported by the body 14 of a cassette, and the pin 26 prepared in the end section is connected with slot 21b formed in the up side face of an attachment component 21 rotatable. A slit 27 is formed in the upper right corner of the body 14 of a cassette, and the rib besides the illustration by the side of the needle-thread swap device 1 presses in contact with the other end 28 of the link member 22 through a slit 27 at the time of wearing to a cassette mount 4.

[0056] The end of the tension coil spring 23 is connected behind an attachment component 21 through a bracket 29, and the other end of the tension coil spring 23 is connected with the body 14 of a cassette. At the time of un-equipping with the needle-thread cassette 3, an attachment component 21 is always held according to the energization force of an extension spring 23 in the protrusion location shown in drawing 4.

[0057] At the time of wearing of the needle-thread cassette 3, said rib presses the other end 28 of the link member 22 to a left in drawing 4, resist the energization force of an extension spring 23, the counterclockwise rotation of drawing 4 is made to rock the link member 22, an attachment component 21 is moved up, and ** ON is carried out into the covering sliding hole 25. At the time of the stowed position of this protective cover 24, the cutting cutting edge 20 is also evacuated in the covering sliding hole 25, and cutting of the needle thread 2 with this cutting cutting edge 20 becomes impossible.

[0058] Next, the margin-of-string attachment component 10 is explained. As shown in drawing 4, the margin-of-string attachment component 10 holds the margin-of-string section of the needle thread 2 cut by the cutting machine style 9, and is prepared near the derivation opening 8. The margin-of-string attachment

component 10 serves as the yarn tension grant device 30, and this yarn tension grant device 30 is a device which gives tension to the needle thread 2 pulled out from the needle-thread bobbin 6, and it has the shank material 31, the below-mentioned press pin 36 formed in this shank material 31 at one, a compression spring 32 and the movable board 34, and the movable boards 33 and 34.

[0059] The supporter material 35 was really fabricated by the body 14 of a cassette at the near [attachment component 21] section of the body 14 of a cassette, and the shank material 31 of the vertical direction sense has fixed in the shape of penetration to this supporter material 35. While the press pin 36 is formed in the lower limit section of the shank material 31 and the movable board 34 is formed above the press pin 36 through a compression spring 37 Furthermore, while the movable board 33 and the compression spring 32 are formed in the upper part and pressing the movable board 33 to the lower part sense by the energization force of a compression spring By pressing the movable board 34 up according to the energization force of a compression spring 37, the needle thread 2 pulled out from the needle-thread bobbin 6 is pinched among these movable boards 33 and 34. In addition, the snap ring member which is not illustrated is prepared between the movable boards 33 and compression springs 32 which were prepared in the shank material 31, and after the press pin 36 was pressed and the shank material 31 has gone up up, it is constituted so that the energization force of a compression spring 32 may not get across to the movable board 34 by this snap ring member.

[0060] Next, the opening operation section 11 is explained. As shown in drawing 4 , drawing 5 , and drawing 7 , the opening operation section 11 operates the yarn tension grant device 30 from the outside, it opens it so that tension may not be given, and has the press pin 36 prepared in the shank material 31 at one, and a compression spring 37. The press pin 36 consists of narrow diameter portion 36a formed in the Johan section, and major diameter 36b formed in the bottom half section, and is constituted possible [vertical sliding]. The narrow diameter portion is constituted possible [press of the inferior surface of tongue of the movable board 33] through the through hole formed in the movable board 34 within the body 14 of a cassette.

[0061] A flange is formed in the upper part of major diameter 36b, the upper parts are consisted of by the step 16 of the body 14 of a cassette possible [engagement], and the compression spring 37 with the energization force smaller than the compression spring 32 of the yarn tension grant device 30 is infixed between this flange and movable board 34. At the time of un-equipping with the needle-thread cassette 3, the movable board 33 is caudad pressed according to the energization force of this compression spring 37, and the tension by the yarn tension grant device 30 is maintained by pressing against the movable board 34. The great portion of major diameter 36b resists the energization force of compression springs 32 and 37 caudad from the body 14 of a cassette in contact with the cam besides the illustration by the side of the needle-thread swap device 1 at the time of wearing of a projection and the needle-thread cassette 3, it carries out upper part migration of the press pin 36, and presses the movable board 33 to the upper part sense to the movable board 34. In addition, when the movable board 33 is pressed up and it is located in a rise location, the thrust of the lower part sense of a compression spring 32 gets across to the movable board 33 by the snap ring member which the above-mentioned does not illustrate.

[0062] Next, the brake mechanism 12 which makes damping force act on the needle-thread bobbin 6 with which the bobbin carrying member 7 is equipped is explained. As shown in drawing 4 , a brake mechanism 12 is twisted with the brake body 38, and consists of springs 39. The brake body 38 is supported pivotably by the pivotable support shaft 40 in the lower left corner of the body 14 of a cassette. The brake body 38 is formed in the shape of an abbreviation triangle, and the crowning of the triangle is supported pivotably. The rotation specification-part material 41 which regulates rotation of the needle-thread bobbin 6 is formed in one corner, and the engaged portion material 42 (that is, brake disconnection member 13) which engages with the engagement section besides the illustration prepared in the needle-thread swap device 1 is formed in the corner of another side.

[0063] It twists, and it is held at the pivotable support shaft 40, and an end is connected with the brake body 38, and the spring 39 is set after the other end has contacted the inside wall of the body 14 of a cassette. At the time of un-equipping with the needle-thread cassette 3, it twists, the brake body 38 is energized in the direction of a clockwise rotation in drawing 4 with a spring 39, and damping force acts [the rotation specification-part material 41] in contact with the periphery edge of the needle-thread bobbin 6 through the notch 43 of the bobbin hold hole 18. A slit 44 is formed in the low wall section of the body 14 of a cassette, and the engagement section by the side of the needle-thread swap device 1 engages with the engaged portion material 42 through this slit 44. At this time, it twists, the energization force of a spring 39 is resisted, the engaged portion material 42 is pressed by the engagement section from a lower part, and regulation by the

rotation specification-part material 41 is opened by the rotation specification-part material 41 being isolated from the needle-thread bobbin 6.

[0064] Next, the removable engagement section 45 is explained to the cassette mount 4 of the needle-thread swap device 1. As shown in drawing 2, drawing 4, drawing 5, and drawing 7, the engagement section 45 to which it shows the wearing actuation to the needle-thread swap device 1 is formed in the right-hand side lower limit section in drawing 4 of the body 14 of a cassette. The engagement section 45 has the piece 46 of engagement of the shape of one pair of rectangle, and the piece 46 of these engagement is arranged crosswise in fixed spacing ***** parallel. By the way, a cassette mount 4 has the engaged portion 47 of one pair of cross-section configurations of L characters, and the engaged portion 48 of a cross-section I form, one pair of pieces 46 of engagement engage with these one pairs of engaged portions 47, respectively, and the engaged portion 48 is constituted possible [insertion] by the clearance between one pair of pieces 46 of engagement.

[0065] Next, the change-over device 50 is explained. As shown in drawing 1 - drawing 3, it is constituted by the needle-thread swap device 1 so that installation support may be carried out movable and the moving-part material 70 equipped with two or more cassette mounts 4 may carry out the migration drive of this moving-part material 70 according to the change-over device 50 at the longitudinal direction of drawing 1. That is, a straight-line guidance device, a drive motor, or an actuator besides illustration etc. is held in the interior of the needle-thread swap device 1. A drive motor or an actuator is driven by the drive control section which is not illustrated, and the location of a cassette mount 4 is switched so that the needle-thread cassette 3 of a desired colored yarn (X) may be located in the needle-thread supply location to sewing equipment.

[0066] Next, an operation of the needle-thread cassette 3 explained above is explained. The needle-thread bobbin 6 which twisted the needle thread 2 first at the time of un-equipping with the needle-thread cassette 3 is inserted in the bobbin hold hole 18 of the cassette object 14, and the bobbin carrying member 7 is equipped. The margin-of-string section of the needle thread 2 pulled out from the needle-thread bobbin 6 is passed through the movable board 34 from the needle-thread feed zone 17, between the movable boards 33 is passed through slit 21a from through and the derivation opening 8, and it derives to the exterior of the cassette object 5. Next, the cassette lid 15 is closed, to the cutting cutting edge 20, it is made to move manually and a needle thread 2 is cut.

[0067] Where a predetermined die-length protrusion is carried out from the derivation opening 8, while the margin-of-string section of a needle thread 2 is held by the margin-of-string attachment component 10 at this time, the protective cover 24 was held in the non-stowed position shown in drawing 4, and has covered the margin-of-string section. It can prevent that the margin-of-string section which this projected touches people's hand etc., and can prevent that the margin-of-string section bends. Moreover, the damping force of a brake mechanism 12 acted and the skid of the needle-thread bobbin 6 is prevented.

[0068] At the time of wearing of the needle-thread cassette 3, the rib by the side of the needle-thread swap device 1 presses the other end 28 of the link member 22, resist the energization force of an extension spring 23, the counterclockwise rotation of drawing 4 is made to rock the link member 22, a protective cover 24 is moved up, and it is made to evacuate in the covering sliding hole 25. Thus, it can prevent becoming the hindrance of the needle-thread exchange actuation by the needle-thread swap device 1 by evacuating a protective cover 24 at the time of wearing of the needle-thread cassette 3. At the time of the stowed position of this protective cover 24, the cutting cutting edge 20 is also evacuated in the covering sliding hole 25, and cutting of the needle thread 2 with this cutting cutting edge 20 becomes impossible.

[0069] Moreover, the press pin 36 of the opening operation section 11 contacts the cam by the side of the needle-thread swap device 1, resists the energization force of compression springs 32 and 37, carries out upper part migration of the press pin 36, and presses the movable board 33 to the upper part sense to the movable board 34. At this time, as mentioned above, when the energization force of a coil spring 32 does not get across to the movable board 33, the pinching force between the movable boards 34 becomes weaker, and this opens the tension by the yarn tension grant device 30.

[0070] Furthermore, it twists, the energization force of a spring 39 is resisted, the engaged portion material 42 is pressed by the engagement section from a lower part, and regulation by the rotation specification-part material 41 is opened by the rotation specification-part material 41 being isolated from the needle-thread bobbin 6. Thus, the damping force by the brake mechanism 12 can be opened by the actuation from the outside of the cassette object 5.

[0071] Like the following, as shown in drawing 1 and drawing 2, a cassette mount 4 is equipped with two or more needle-thread cassettes 3 which held the needle thread 2 of a different colored yarn, respectively,

and the location of a cassette mount 4 is switched so that one of the arbitration of two or more needle-thread cassettes 3 by the change-over device 50 may be located in needle-thread supply location (b) to sewing equipment. Then, a sewing activity is done after performing needle-thread exchange actuation of the selected needle-thread cassette 3.

[0072] According to the needle-thread cassette 3 explained above, since the needle thread 2 pulled out from the needle-thread bobbin 6 with which the bobbin carrying member 7 was equipped is cut at cutting machine guard 9 and the margin-of-string section of the cut needle thread 2 is held by the margin-of-string attachment component 10, need to pull out the margin-of-string section, it is not necessary to set it for every cassette wearing, and the color substitute activity of a needle thread 2 or yarn exchange activity under sewing activity simplifies. Since the margin-of-string section of a needle thread 2 is held by the margin-of-string attachment component 10 where a predetermined die-length protrusion is carried out, while being able to attain automation of the color substitute activity of a needle thread 2, or a yarn exchange activity using the change-over device 50 by the side of the needle-thread swap device 1, it can prevent that a needle thread 2 solves suddenly from the margin-of-string attachment component 10, twine, or the margin-of-string section is drawn in a needle-thread cassette.

[0073] Since the margin-of-string attachment component 10 and the cutting machine style 9 were formed near the derivation opening 8, where the margin-of-string section of a needle thread 2 is made to project to the exterior of the cassette object 5, a needle thread 2 can be cut preventing yarn slack and a **** ball. Since the needle-thread bobbin 6 has small shaft-orientations width of face as compared with the diameter, it can form the cassette object 5 comparatively thinly, and can attain miniaturization of the cassette object 5, and lightweight-ization.

[0074] Damping force can be made to be able to act on the needle-thread bobbin 6 according to a brake mechanism 12, a skid of the needle-thread bobbin 6 can be prevented, and the yarn slack inside a cassette and a **** ball can be prevented. Moreover, the brake disconnection member 13 can be operated from the exterior of the cassette object 5, and the damping force by the brake mechanism 12 can be opened easily.

[0075] Since all of the cassette object 5 and the needle-thread bobbins 6 consisted of transparent materials which can check by looking the needle thread 2 twisted around the needle-thread bobbin 6 inside a cassette, they can check the colored yarn and yarn residue of a needle thread 2 from the outside, and are convenience variously.

[0076] According to the needle-thread swap device 1 explained above, a cassette mount 4 can be equipped with two or more needle-thread cassettes 3, and according to the change-over device 50, the needle thread 2 of the colored yarn of a change and said needle-thread cassette 3 (X) can be supplied for the location of a cassette mount 4 easily [sewing equipment] so that one of the arbitration of two or more needle-thread cassettes 3 may be located in the needle-thread supply location to sewing equipment. Since the miniaturization of the needle-thread cassette 3 can be attained, the miniaturization of needle-thread swap device 1 the very thing can be attained.

[0077] Next, the modification gestalt which changed the needle-thread cassette of this operation gestalt partially is explained. However, the same sign is given to the member same in the first half as an operation gestalt, and explanation is omitted suitably. Needle-thread cassette 3A has the cassette object 51, the yarn die 52 as a spool member, the yarn-die presser foot 53, the pivotable support shaft 54, the axial supporter material 55, a linkage 56, the derivation opening 8, and the cutting machine style 9 of the same structure as said operation gestalt, the yarn tension grant device 30 and the opening operation section 11, as shown in drawing 9 - drawing 11. However, the brake mechanism of said operation gestalt and the brake disconnection member are omitted.

[0078] It has the body 57 of a cassette, and the cassette lid 58, those all consist of transparent materials made of synthetic resin, and the cassette object 51 can check by looking the needle thread 2 twisted around the yarn die 52 inside a cassette. The back acclivity-like yarn-die hold section 59 is formed in the body 57 of a cassette, and the yarn die 52 is held in this yarn-die hold section 59. This body 57 of a cassette is formed in the width method are twice [about] many as the width method of the body 14 of a cassette of said operation gestalt. The yarn-die hold section 59 consists of the needle-thread feed zone 60, the taper section 61, the straight section 62, the back end side-attachment-wall section 63, and a flange 64 from the right end section in drawing 9 one by one.

[0079] As shown in drawing 9, the axial supporter material 55 and the pivotable support shaft 54 are connected with the flange 64 rotatable in one through the linkage 56. That is, the axial supporter material 55 is connected with the flange 64 of the body 57 of a cassette by bracket 55a, and fixes the pivotable support shaft 54 in the shape of a support at one end. These shafts supporter material 55 and the pivotable support

shaft 54 are equivalent to a bobbin carrying member. A linkage 56 connects the axial supporter material 55 and the pivotable support shaft 54 with the cassette object 51 rotatable covering an accommodated location and an exchange location including the pin 65 which connects a flange 64, bracket 55a, and these flanges 64 and bracket 55a. Said accommodated location is a location which holds a yarn die 52 in the interior of the cassette object 51 as shown in drawing 9 and drawing 11, and an exchange location is a location to which the cassette lid 58 was opened wide and the pivotable support shaft 54 was leaned for the yarn die 52 from the accommodated location exchangeable, as shown in drawing 10.

[0080] As shown in drawing 9, drawing 10, drawing 12, and drawing 13, it is prepared possible [wearing of the yarn-die presser foot 53 which presses down the yarn die 52 supported pivotably by the pivotable support shaft 54]. This yarn-die presser foot 53 consists of the fixed part 66 fixed to the pivotable support shaft 54, and the rotation section 67 supported rotatable to that fixed part 66. Two or more guide rail 67a to which it shows a needle thread 2 is formed in the periphery edge of the rotation section 67. In addition, in the lower part location, the flat spring 68 is formed in the body 57 of a cassette from the yarn-die hold section 59. At the time of wearing of needle-thread cassette 3A, the rib besides the illustration by the side of a needle-thread swap device passes along a slit 69, and engages with this flat spring 68. [0081] An operation of needle-thread cassette 3A explained above is explained. The cassette lid 58 is opened and an exchange location is made to rotate the pivotable support shaft 54 and the axial supporter material 55 according to a linkage 56. A yarn die 52 is supported pivotably on the pivotable support shaft 54 in this exchange location, the pivotable support shaft 54 is equipped with the yarn-die presser foot 53, a yarn die 52 is pressed down, the yarn tension grant device 30 is minded for the margin of string of the needle thread 2 wound around the yarn die 52, and it is a drawer from the derivation opening 8. At this time, the needle thread 2 pulled out from the yarn die 52 will be guided at slot 67a with proper guide rail 67a formed in the yarn-die presser foot 53. Next, an accommodated location can be made to be able to rotate the pivotable support shaft 54 and the axial supporter material 55 according to a linkage 56 with a yarn die 52, the cassette lid 58 can be closed, and sewing can be presented like the account operation gestalt of back to front.

[0082] According to said needle-thread cassette 3A, the yarn die 52 marketed as a yarn die generally used for a domestic sewing machine as a bobbin member is applicable. An exchange location is made to rotate the pivotable support shaft 54 and the axial supporter material 55 according to a linkage 56, a yarn die 52 can be supported pivotably on the pivotable support shaft 54, and an accommodated location can be made to rotate it according to a linkage 56. So, exchange of a yarn die 52 simplifies. Since it shows guide rail 67a of this yarn-die presser foot 53 to the needle thread 2 pulled out from the yarn die 52, from a yarn die 52, a needle thread 2 is stabilized, and is pulled out, and (generating of a debt of yarn, a lap, etc.) can be prevented not from **** but from the yarn by the slack of the needle thread 2 within a cassette. In addition, the same effectiveness as said operation gestalt is done so.

[0083] With the above-mentioned operation gestalt, although a needle-thread swap device is equipped with a needle-thread cassette, you may make it the configuration which equips the proper place of the arm section of a sewing machine with a needle-thread cassette. It is good also as a thing for showing the wearing actuation to sewing equipment to the engagement section to which it shows the wearing actuation to the needle-thread swap device 1. A pivotable support shaft may be equipped with a yarn die pivotable. In addition, it can carry out with the gestalt which added various modification to said operation gestalt in the range which does not deviate from the meaning of the invention in this application.

[0084]

[Effect of the Invention] According to invention of claim 1, since the needle thread pulled out from the bobbin member with which the bobbin carrying member was equipped is cut at cutting machine guard and the margin-of-string section of the cut needle thread is held by the margin-of-string attachment component, need to pull out the margin-of-string section, it is not necessary to set it for every cassette wearing, and the color substitute activity of a needle thread or yarn exchange activity under sewing activity simplifies.

[0085] Since according to invention of claim 2 the margin-of-string section of a needle thread is held by the margin-of-string attachment component where a predetermined die-length protrusion is carried out, while being able to attain automation of the color substitute activity of a needle thread, or a yarn exchange activity using the device by the side of equipment, it can prevent that a needle thread solves suddenly from a margin-of-string attachment component, twine, or the margin-of-string section is drawn in a needle-thread cassette. In addition, the same effectiveness as claim 1 is done so.

[0086] According to invention of claim 3, since the margin-of-string attachment component and the cutting machine style were prepared near the derivation opening, where the margin-of-string section of a needle thread is made to project to the exterior of a cassette object, a needle thread can be cut, preventing yarn slack

and a **** ball. In addition, claim 1 or the same effectiveness as 2 is done so. According to invention of claim 4, tension can be given to the needle thread pulled out from a bobbin member by the yarn tension grant means. In addition, the same effectiveness as claims 1-3 is done so.

[0087] According to invention of claim 5, it can open wide so that a yarn tension grant means may be operated from the outside and tension may not be given to a needle thread by the opening operation section, and it can let out a needle thread to the exterior of this needle-thread cassette easily. In addition, the same effectiveness as claim 4 is done so. According to invention of claim 6, since a margin-of-string attachment component serves as said yarn tension grant means, the margin-of-string section of a needle thread can be held by giving tension to the needle thread pulled out from a bobbin member. In addition, claim 4 or the same effectiveness as 5 is done so.

[0088] According to invention of claim 7, the width method of a needle-thread cassette can be made small, and the miniaturization of the needle-thread cassette itself can be attained. In addition, the same effectiveness as that of claims 1-6 is done so. According to invention of claim 8, damping force can be made to be able to act on a needle-thread bobbin according to a brake mechanism, a skid of a needle-thread bobbin can be prevented, and the yarn slack inside a cassette and a **** ball can be prevented. In addition, the same effectiveness as claim 7 is done so.

[0089] According to invention of claim 9, a brake disconnection member can be operated from the exterior of a cassette object, and the damping force by the brake mechanism can be opened easily. In addition, the same effectiveness as claim 8 is done so. According to invention of claim 10, the bobbin member with which a bobbin carrying member is equipped can apply the existing yarn die from it being a yarn die. In addition, the same effectiveness as claims 1-6 is done so.

[0090] According to invention of claim 11, open a cassette lid and an exchange location is made to rotate a pivotable support shaft and axial supporter material according to a linkage, a yarn die can be supported pivotably on a pivotable support shaft, and an accomodated location can be made to rotate a pivotable support shaft and axial supporter material according to a linkage with a yarn die after that. In addition, the same effectiveness as claim 10 is done so.

[0091] Since the needle thread which equipped the pivotable support shaft with the yarn-die presser foot, pressed down the yarn die, and was pulled out by the guide rail of this yarn-die presser foot from the yarn die is guided according to invention of claim 12, from a yarn die, a needle thread is stabilized and is pulled out. In addition, the same effectiveness as claim 11 is done so. According to invention of claim 13, since the rotation section is rotated in connection with a needle thread being pulled out from a yarn die where a needle thread is guided one of two or more guide rails, it can prevent that excessive tension acts on the needle thread pulled out from a yarn die. In addition, the same effectiveness as claim 12 is done so.

[0092] According to invention of claim 14, since some or all of a cassette object consisted of transparent materials which can check by looking the needle thread twisted around the bobbin member inside a cassette, they can check the colored yarn and yarn residue of a needle thread from the outside, and is convenience variously. In addition, the same effectiveness as any of claims 1-13 they are is done so.

[0093] According to invention of claim 15, since some or all of a cassette object and a needle-thread bobbin consisted of transparent materials which can check by looking the needle thread twisted around the needle-thread bobbin inside a cassette, they can check the colored yarn and yarn residue of a needle thread from the outside, and is convenience variously. In addition, the same effectiveness as any of claims 7-9 they are is done so.

[0094] According to invention of claim 16, a needle-thread swap device can be equipped with the needle-thread cassette of two or more classification by color, and it can embroider by supplying the needle thread of a desired colored yarn alternatively from one of any needle-thread cassettes of these. In addition, the same effectiveness as any of claims 1-15 they are is done so. According to invention of claim 17, the proper place of the arm section of a sewing machine can be equipped with the needle-thread cassette of a desired colored yarn, and a sewing activity can be done. In addition, the same effectiveness as any of claims 1-16 they are is done so.

[0095] According to invention of claim 18, a cassette mount can be equipped with two or more needle-thread cassettes, and according to a change-over device, the needle thread of the colored yarn of a change and said needle-thread cassette can be supplied for the location of a cassette mount to sewing equipment so that one of the arbitration of two or more needle-thread cassettes may be located in the needle-thread supply location to sewing equipment. According to invention of claim 19, the needle thread pulled out from a spool member at cutting machine guard is cut, and the margin-of-string section of the cut needle thread is held by the margin-of-string attachment component, and after it equips a needle-thread swap device with this

needle-thread cassette after that, it can do a sewing activity.

[0096] According to invention of claim 20, rotation of the bobbin member with which the bobbin carrying member was equipped pivotable can be regulated by rotation specification-part material, and a skid of a bobbin member can be prevented. According to invention of claim 21, in the state of un-equipping with a cassette object, rotation of a bobbin member is regulated by rotation specification-part material, and in the state of wearing of a cassette object, the engaged portion material by the side of a needle-thread cassette can engage with the engagement section by the side of equipment, regulation by rotation specification-part material can be opened wide, and it can let out the needle thread twisted around the bobbin member. In addition, the same effectiveness as claim 20 is done so.

[0097] According to invention of claim 22, since the wearing actuation to sewing equipment or a needle-thread swap device is guided by the engagement section of a cassette object, wearing actuation simplifies by it. So, sewing equipment or a needle-thread swap device can be quickly equipped with two or more needle-thread cassettes. In addition, claim 20 or the same effectiveness as 21 is done so.

[0098] According to invention of claim 23, in the condition of a needle-thread cassette of not equipping, the margin-of-string section of a needle thread is pulled out from the bobbin member with which the bobbin carrying member was equipped, a needle thread is cut as a cutting machine style is also, so that a predetermined die-length protrusion may be carried out from derivation opening, and the margin-of-string section of this cut needle thread is held by the margin-of-string attachment component, and can equip a needle-thread swap device with this needle-thread cassette after that.

[0099] According to invention of claim 24, it can prevent that the margin-of-string section of the needle thread which carries out a predetermined die-length protrusion is covered with a protective cover, and the projecting margin-of-string section is exposed from derivation opening in the non-stowed position of a cassette object. So, when people's hand touches, it can prevent that the margin-of-string section bends. In the stowed position to the equipment of a cassette object, a protective cover can be evacuated from the margin-of-string section, and the margin-of-string section can be exposed so that it may not become the hindrance of the needle-thread exchange actuation by the needle-thread swap device. In addition, the same effectiveness as claim 23 is done so.

[0100] According to invention of claim 25, in the non-stowed position of a cassette object, the margin-of-string section of the needle thread which cuts a needle thread with a cutting cutting edge, and projects that the attachment component of a cutting machine style is also can be covered. In addition, the same effectiveness as claim 24 is done so.

[0101] According to invention of claim 26, with a yarn tension grant means, since tension can be given to the needle thread pulled out by the exterior of a cassette object, the needle thread beyond the need is pulled out by neither sewing equipment nor the needle-thread swap device, and the slack of yarn and generating [yarn] can be prevented.

[0102] According to invention of claim 27, since it is the yarn pinching member which pinches the needle thread which is prepared near said derivation opening and pulled out from the derivation opening, a yarn tension grant means can pinch a needle thread by the yarn pinching member [near the derivation opening], and can give tension to the needle thread pulled out outside. In addition, the same effectiveness as claim 26 is done so.

[0103] According to invention of claim 28, the margin-of-string section of the needle thread pulled out from derivation opening can be certainly held by pinching a needle thread by the yarn pinching member. In addition, the same effectiveness as claim 27 is done so.

[0104] According to invention of claim 29, it can open wide so that the opening operation section may not give tension to a needle thread, and it can let out a needle thread to the exterior of this needle-thread cassette easily. In addition, claim 27 or the same effectiveness as 28 is done so.

[Translation done.]

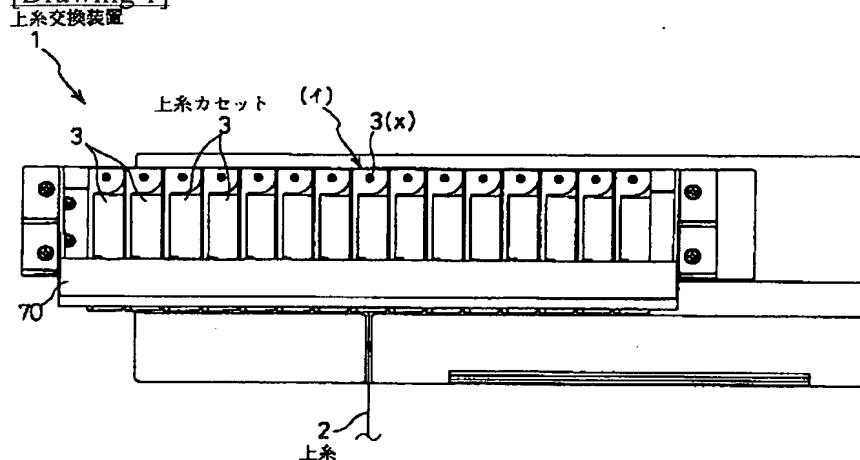
* NOTICES *

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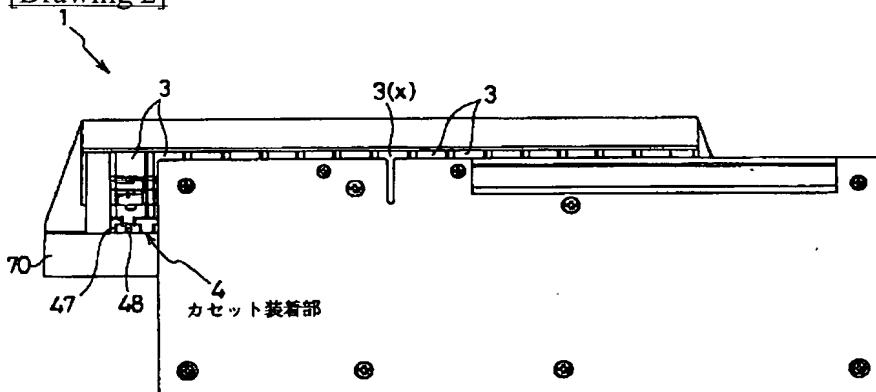
1. This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

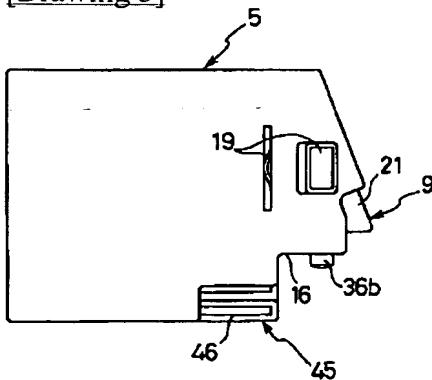
[Drawing 1]



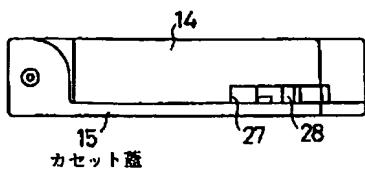
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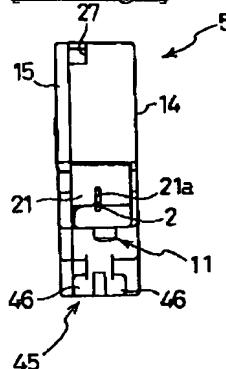
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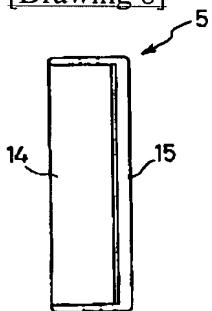
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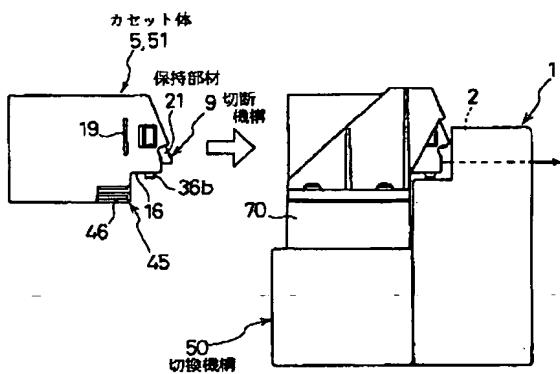
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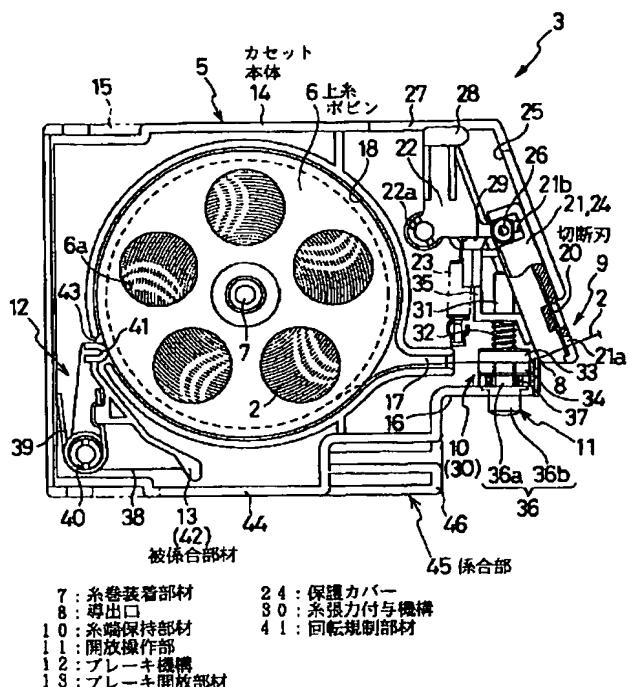
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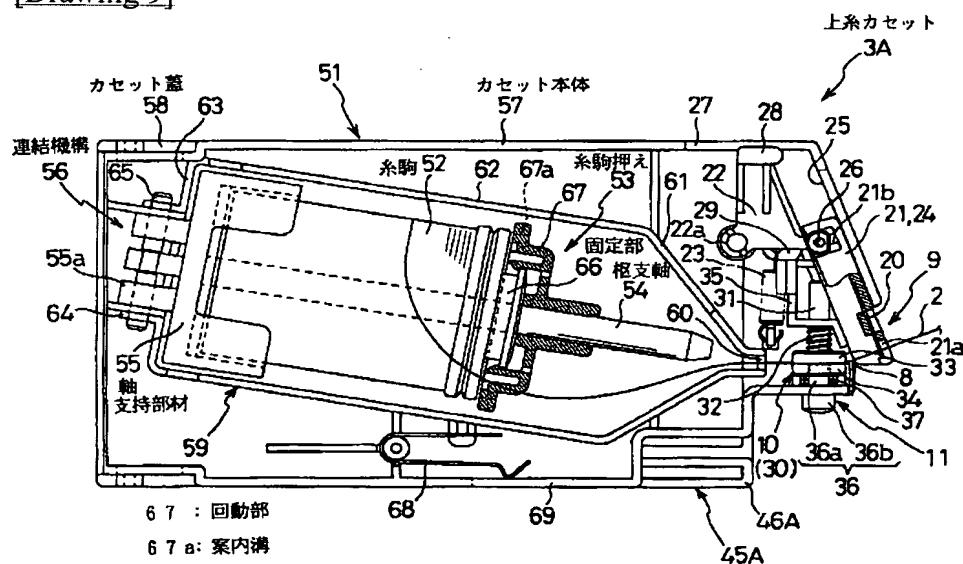
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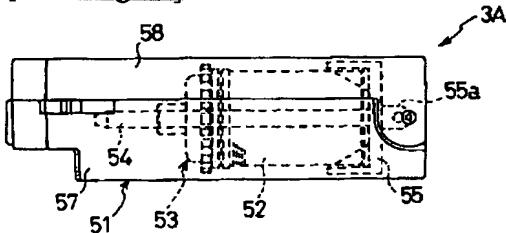
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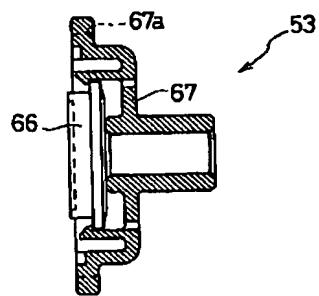
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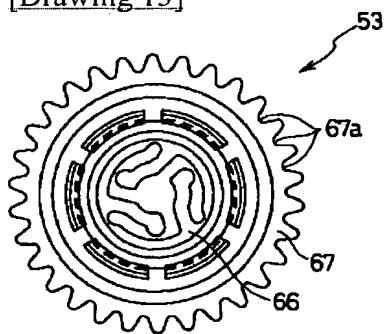
[Drawing 11]



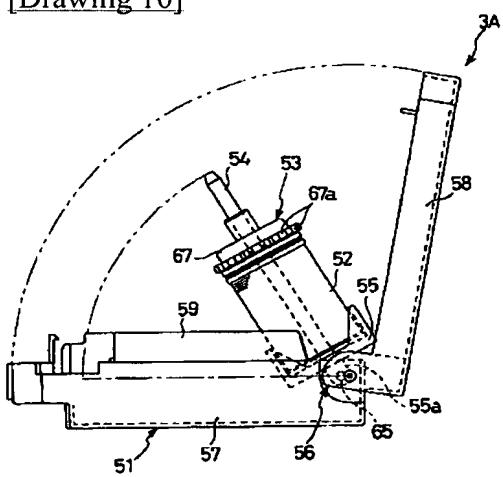
[Drawing 12]



[Drawing 13]



[Drawing 10]



[Translation done.]